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Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, D.C.

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

In the Matter of

Advanced Television Systems )  
and Their Impact upon the ) MM Docket No. 87-268  
Existing Television Broadcast Service )

To: The Commission

COMMENTS OF CHRIS-CRAFT/UNITED GROUP

The Chris-Craft/United Group of television broadcast stations hereby submits the following comments in response to the Sixth Further Notice Of Proposed Rule Making in this proceeding.

The Chris-Craft/United Group is comprised of the eight television stations owned and operated by Chris-Craft Industries, Inc., and its controlled subsidiaries BHC Communications, Inc. and United Television, Inc. These stations are KCOP(TV), Channel 13, Los Angeles, California; WWOR-TV, Channel 9, Secaucus, New Jersey; KBHK-TV, Channel 44, San Francisco, California; KPTV, Channel 12, Portland, Oregon; KMOL-TV, Channel 4, San Antonio, Texas; KTVX(TV), Channel 4, Salt Lake City, Utah; KMSP-TV, Channel 9, Minneapolis, Minnesota; and KUTP(TV), Channel 45, Phoenix, Arizona.

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Chris-Craft/United Group is a member of the Broadcasters' Caucus and once again is a signatory to the Joint Broadcasters' Comments to evidence its general support for the consensus positions espoused in those comments. The instant individual comments being submitted by Chris-Craft/United Group are intended to focus the Commission's attention on one critical deficiency in the Sixth Further Notice -- the unacceptable level of interference to licensed land mobile operations that would be caused by the proposed allocation of DTV channel 18 to WWOR-TV -- and to emphasize certain other important points.

#### **I. THE PROPOSED TABLE OF ALLOCATIONS**

At the outset, Chris-Craft/United Group wishes to stress that it is a strong supporter of the conversion of broadcast television to digital channels and wants the process to move forward as quickly as possible. If free, over-the-air television is to survive as a universal service -- nothing less would serve the public interest -- it must be allowed to be competitive and to offer a universally accepted system. To this end, it is essential that the Commission promptly adopt the Grand Alliance proposal and an initial table of digital allocations.

With the exception of the WWOR-TV channel 18 allocation, Chris-Craft/United Group is generally satisfied with the DTV channels proposed by the Commission for each of the Chris-Craft/United Group stations. While in several cases the Chris-Craft/United Group would prefer channels which were proposed for other stations in their respective markets, Chris-Craft/United

Group recognizes the difficulties faced by the Commission in attempting to develop a table of allocations that treats everyone fairly under the proposed allocation criteria and is willing, at least initially, to accept the allocations proposed for seven of its eight stations.<sup>1</sup>

Chris-Craft/United Group submits, however, that the proposal to allocate channel 18 to WWOR-TV would cause objectionable interference to land mobile operations on first adjacent channel 19 in the state of New Jersey and must be changed. WWOR-TV serves the New York television market from atop the World Trade Center, which is the designated site for the channel 18 allocation as well as for the allocations for most New York market stations. Channel 19 has previously been specified for land mobile use in Philadelphia and, as a result, is being used by numerous private and public safety organizations from scores of sites throughout the state of New Jersey. See Engineering Statement of Cohen, Dippell and Everist ("CD&E Engineering Statement"), attached hereto. The distance between the World Trade Center and the center-city reference coordinates of Philadelphia is only 80.0 miles, 60 miles less than the existing NTSC/land mobile first adjacent spacing requirement of 140 miles and *30 miles (27%) less than the DTV/land mobile first adjacent spacing of 110 miles (176 km) proposed by the Commission!*

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<sup>1</sup> Chris-Craft/United Group is concerned that the power level to be used by KRON-TV on proposed digital channel 18 in San Francisco could cause problems for KBHK-TV on its proposed digital channel 19. This concern may be alleviated by future technical developments; but Chris-Craft/United Group reserves the right to modify its position on this allocation if the potential problems appear insurmountable.

In proposing DTV channel 18 for WWOR-TV, in violation of its own proposed minimum spacing requirement, the Commission undoubtedly assumed that land mobile authorizations on channel 19 were limited to a radius of 50 miles around the city center of Philadelphia, as provided in the Rules, with mobile units operating within a radius of 30 miles of each base station. But that assumption is incorrect. As a result of the demand for land mobile operations in this highly populated region, licensed channel 19 land mobile facilities have not been limited to the areas immediately surrounding the city limits of Philadelphia. Rather, they include a heavy concentration of base and repeater sites and mobile units in central and northern New Jersey, many of which sites and units have been licensed by the Commission beyond the 50/30 mile ranges normally permitted under the rules. To make matters more critical, most of the licensees for these sites and units are governmental bodies who use them for public safety purposes. See CD&E Engineering Statement.

The CD&E Engineering Statement contains an analysis by the consulting engineering firm of Cohen, Dippell and Everist which concludes that extensive interference to channel 19 land mobile operations in New Jersey would be caused by a WWOR-TV DTV television station broadcasting on channel 18. Moreover, there are no known methods for adequate remediation of such interference at a manageable cost through filtering or similar techniques without substantially limiting the coverage of the interfering broadcast station. The level of TV signal out of band emissions to the land mobile signal is too

great. Thus the problem can be dealt with only by (1) requiring the land mobile users to live with such interference; (2) relocating New Jersey land mobile operations to another frequency; (3) requiring channel 18 to be operated at substantially reduced power; or (4) finding another DTV channel for WWOR-TV.

The first two alternatives noted above are obviously not ideal solutions. And the third alternative, operating channel 18 at reduced power, is a most unacceptable one. The degree of power reduction needed to avoid the objectionable interference would not merely prevent WWOR-TV from replicating or even approximating the coverage of its current channel 9, but would prevent WWOR-TV from offering a competitive DTV signal. Given the huge expense for conversion to digital operations, the allocation of a non-competitive channel cannot be regarded as serving the public interest

Furthermore, the Commission must recognize that WWOR-TV's city of license was changed from New York to New Jersey as a result of a special Congressional mandate intended to improve television broadcast service to New Jersey. See 47 U.S.C. § 331. As a result of that change, WWOR-TV has built the premier commercial television news operation in the state of New Jersey, and devotes a substantially higher percentage of its news coverage to New Jersey stories than any of the stations assigned to New York City. Given WWOR-TV's service obligations to New Jersey, the Commission must assure that the DTV allocation for WWOR-TV, in particular, permits full power and a replicating signal. The channel 18 allocation for WWOR-TV, because of the power levels

that would be required for replicating coverage, could not do that without causing unacceptable levels of interference to land mobile operations.

An alternative that would correct this problem is the modified DTV table of allocations being proposed by the Broadcasters' Caucus. This modified table would change several of the channels proposed by the Commission for the Chris-Craft/United Group stations, including the substitution of channel 53 for channel 18 as the allotment for WWOR-TV. The Chris-Craft/United Group supports the entire modified table as an alternative to the table proposed by the Commission, and is willing, at least initially, to accept all of the channels proposed in the modified table for the Chris-Craft/United Group stations. But if the modified table is not adopted, Chris-Craft/United Group submits that another alternative to channel 18 for WWOR-TV must be found.

## **II. TRANSITION PROCEDURES FOR MODIFYING TABLE**

Regardless of whether the Commission uses its own proposed table of allocations, adopts the modified table proposed by the Broadcasters' Caucus, or utilizes some modified version of either or both, the novelty of digital broadcasting and the limited amount of existing empirical data make it virtually certain that problems will arise during the implementation phase which will require or otherwise warrant changes to the table. Stations may not be able to find tower space or obtain leases or governmental approvals for towers within the geographic areas specified by the rules; unanticipated interference may arise; or replicated coverage may in some cases be substantially less than

predicted. For these reasons, Chris-Craft/United Group submits that the Commission should maintain maximum flexibility for modifying the initial allocations. In order to permit such flexibility, Chris-Craft/United Group emphasizes the position advocated in the Joint Broadcasters' Comments: that the Commission should not adopt the core spectrum proposal.<sup>2</sup>

In addition, the Commission should adopt procedures for expedited processing of requests for modifications to the initial DTV allocations table. Expedited consideration and processing should especially be given in situations where a market wide plan obtains the consent of all market stations or otherwise can be shown not to cause impermissible interference to another NTSC or DTV station. Chris-Craft/United Group suggests that, during the transition period following final adoption of a initial DTV table of allocations, the Commission not entertain petitions for additions to the table. During that period, existing stations should be able to seek changes to their initial DTV allocations without the risk of facing competing applications for new stations and should have a priority to change their digital channel to that of an unbuild

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<sup>2</sup> Another important reason for rejecting the core spectrum proposal at this time is the need to accommodate existing translators and low power stations. This is especially true in the Salt Lake City television market, which has the largest geographical DMA in the country covering the entire State of Utah plus portions of Arizona, Colorado, Nevada, Idaho, Montana and Wyoming. Approximately 20% of the population of this DMA lives beyond the grade B contours of the Salt Lake City stations, including KTVX, and receives its television coverage from translator signals. The cable systems in these areas, which have high penetration, also rely on translators for reception of the Salt Lake City stations at their respective head ends. To serve such a large area, many translators serve as repeaters for yet other translators, and some locations are reached by as many as five hops of translators. To provide coverage with good quality and low interference, the existing translator structure is based on a plan worked out through a cooperative effort in the market which utilizes the upper UHF channels as primary repeaters. KTVX alone has five such translators, which both cover population centers and serve as repeater hops, in the channel 60-69 block. The elimination of these channels from those allocated for television use would thus have a substantial adverse affect on stations, cable systems and viewers throughout the market.

allocation in the same or adjacent market. The Commission should also provide in its rules that competing applications may not be filed for channels resulting from modifications to DTV allocations specified in the initial, final table.

### III. CONCLUSION

Chris-Craft/United Group is committed to the prompt implementation of digital broadcasting. We urge the Commission to act promptly to approve the Grand Alliance system and a table of allocations so that broadcasters can bring to their viewers the benefits of the digital age.

Respectfully submitted,

CHRIS-CRAFT/UNITED GROUP

By Marvin J. Diamond  
Marvin J. Diamond

Law Offices of Marvin J. Diamond  
464 Common Street, #365  
Belmont, MA 02178

November 22, 1996



ENGINEERING STATEMENT  
ON BEHALF OF  
CHRIS CRAFT/UNITED GROUP  
IN SUPPORT OF ITS COMMENTS  
IN MM DOCKET NO. 87-268  
SIXTH FURTHER NOTICE OF PROPOSED RULE MAKING

NOVEMBER 1996

COHEN, DIPPELL AND EVERIST, P.C.  
CONSULTING ENGINEERS  
RADIO AND TELEVISION  
WASHINGTON, D.C.

COHEN, DIPPELL AND EVERIST, P. C.

City of Washington           )  
  ) ss  
District of Columbia        )

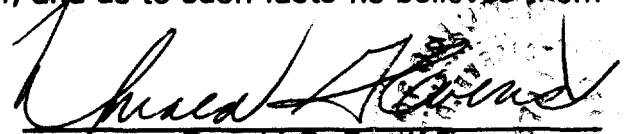
Donald G. Everist, being duly sworn upon his oath, deposes and states that:

He is a graduate electrical engineer, a Registered Professional Engineer in the District of Columbia, and is President of Cohen, Dippell and Everist, P.C., Consulting Engineers, Radio - Television, with offices at 1300 L Street, N.W., Suite 1100, Washington, D.C. 20005;

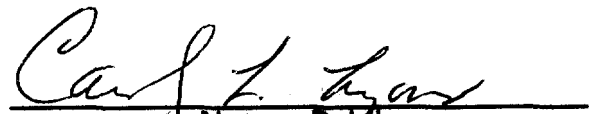
That his qualifications are a matter of record in the Federal Communications Commission;

That the attached engineering report was prepared by him or under his supervision and direction and

That the facts stated herein are true of his own knowledge, except such facts as are stated to be on information and belief, and as to such facts he believes them to be true.

  
\_\_\_\_\_  
Donald G. Everist  
District of Columbia  
Professional Engineer  
Registration No. 5714

Subscribed and sworn to before me this 21<sup>st</sup> day of November, 1996.

  
\_\_\_\_\_  
Notary Public

My Commission Expires: 2/28/98

This engineering statement has been prepared on behalf of Chris Craft/United Group for WWOR-TV ("WWOR") and it provides the results of analysis of the proposed digital television channel allotment for Channel 9, WWOR, licensed to Secaucus, New Jersey. At present, WWOR operates on an assigned Channel 9 with an effective radiated power of 61.7 kW and a height above average terrain of 500 meters. In the Sixth Further Notice of Proposed Rule Making of MM Docket No. 87-268 ("Sixth Notice"), WWOR was assigned Channel 18 as its DTV allotment with an effective radiated power of 260.5 kW and a height above average terrain of 500 meters.

In the Sixth Notice, the Commission provided a draft digital television "DTV" Table of Allotments used to provide a second 6 MHz spectrum block for all television licensees, permittees, and applications for construction permit on file as of October 24, 1991.

This office has reviewed the Sixth Notice and the associated DTV Table of Allotments ("Table") within and around the Greater New York City Metropolitan Market. This office finds serious compatibility concerns with the table relating to DTV to land-mobile interference.

#### Interference to Land-Mobile

The WWOR Channel 18 DTV allotment is first-adjacent to the Philadelphia, Pennsylvania, Channel 19, land-mobile, center-city reference coordinates located 128

km (80.0 miles) southwest of the WWOR transmitting site. The current NTSC land-mobile first-adjacent channel spacing is 140 miles (225 km) and this represents a 60 mile short-spacing.

In FCC Docket 18261, concerning sharing of UHF-TV channels with land-mobile radio, a land-mobile protected contour of 128 km (80 miles) in radius was provided. Under FCC Rule 90.305(a) and (b) land-mobile base stations are permitted to operate up to 80 km (50 miles) from the city-center reference coordinates while associated mobile stations may operate within 48 km (30 miles) of the respective base stations.

The Commission has licensed scores of Channel 18 land-mobile base stations, more than 30 miles outside of the permitted 50-mile radius. Figure 1 depicts six (6) typical Channel 18 land-mobile base sites located near WWOR, which were used for sample evaluations within this engineering statement.

While the Sixth Notice refers to a protected land-mobile contour of 39 dBu, a maximum facility base station (1 kW/500 feet) will place an (F50,50) signal well below 39 dBu at a distance of 48 km (30 miles). Similarly, base stations with less than maximum facilities will place a much lower field strength at 48 km (30 miles). Furthermore, the FCC itself in Report Number R6406 recognizes commercially acceptable service at the 25 dBu median field strength contour; 14 dB lower than the 39 dBu level.

Section 73.687(e) places a heavy burden on new TV broadcast station permittees operating on Channel 14 and 69 to undertake special precautions to avoid interference to adjacent land-mobile radio service operations. Application of this "last-in" rule to the WWOR, Channel 18 DTV allotment would render Channel 18 as useless for any DTV operations. Contributing factors are as follows:

- Research of an FCC data base finds scores of Channel 18 land-mobile base stations located at greater than 80 miles from Philadelphia, in the northern New Jersey area (more than 48 km (30 miles) violation of 80 km (50 mile) rule.
- From a preliminary inspection of the land-mobile data, it appears that over half are licensed to governmental and public safety organizations.
- Regularly used land-mobile signals at field strengths well below 39 dBu will continue to be a problem. Note that Section 73.687(e)(4)(ii) requires that a TV permittee must identify potential interference to normal land-mobile operation.
- Following full-power tests WVEU-TV, Channel 69, Atlanta, Georgia, was initially required to reduce power by 30 dB due to its interference problems. Following installation of a higher power filter, WVEU tested under special temporary authority two weeks at half-power. Following more interference complaints, the broadcast bureau modified WVEU's limited authority to 166 kW (-12 dB).
- Other channel 14/69 stations within the U.S. are still operating at significantly reduced power levels because of interference to land-mobile operations.
- Our expert opinion is that upper and/or lower adjacent channel filtering of NTSC transmissions systems is relatively simple compared to that likely to be required for DTV system due to higher spectrum occupancy.

- Our expert opinion is that it is impracticable to put retrofit filters into existing land-mobile receivers.
- An approximate reduction of 26 dB in DTV power from 260.5 kW to 0.65 kW<sup>1</sup> will be required to protect the land-mobile 39 dBu contours.

Interference From Land-Mobile

Even assuming that WWOR could tailor its Channel 18 DTV operation to minimize its impact on adjacent-channel land-mobile operations, WWOR's signal would be subject to severe interference from two-way radio base and mobile operations. This problem will be further exacerbated in areas of urban clutter and wooded areas due to depolarization effects by the land-mobile signal, thus losing much of the 15 dB cross-polarization rejection factor.

SAMPLE EVALUATIONS  
FOR PROPOSED CHANNEL 18 DTV ALLOTMENT  
IN THE SIXTH NOTICE TO  
EXISTING CHANNEL 19 LAND-MOBILE OPERATIONS  
NOVEMBER 1996

For a preliminary evaluation of land-mobile protection by an adjacent-channel DTV operation, the following has been used:

- Land Mobile Protected Service Contour = +39 dBu
- D/U Ratio = 22 dB
- Maximum interfering signal @ L-M 39 dBu contour = +17 dBu
- Assuming 15 dB cross polarization, Max. Horizontally polarized DTV signal at L-M 39 dBu contour = 32 dBu

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<sup>1</sup>Based on preliminary calculations, Ch. 18 noise limited F(50,90) contour of 43.8 dBu at 500 meters will extend approximately 50 km and be subject to adjacent channel land-mobile interference.

For computations, the following has been used:

- WWOR DTV Ch. 18 = 265 kW/510 Meters (from DTV Table of Sixth Further Notice)
- For out-of-band response of -35 dB, WWOR-DTV (from Paragraph 56, Fifth Further Notice)
- Threshold interference signal level is  $32 + 35 = 67$  dBu  
Table below tabulates threshold WWOR-DTV signal versus land-mobile frequency

<u>L-M Frequency</u> mHz	<u>WWOR-DTV Out-of-Band Response</u> dB	<u>WWOR-DTV Signal For L-M Interference</u> dBu	<u>F(50,10) Distance From WWOR-DTV</u>	
			km	Miles
500	-35	67	98	61
501	-35.6	67.6	95	59
502	-37.8	69.8	88	55
503	-41.2	73.2	75	47
504	-46.1	78.1	62	38
505	-52.4	84.4	45	28
506	-60	92	29	18

A further evaluation is made which demonstrates the magnitude of the land-mobile potential interference by plotting various licensed land-mobile sites obtained from the Commission's data base in relation to the proposed WWOR DTV allotment. The results of this study are shown in Exhibit 2 to 7 in relation to 29 km, 45 km, 62 km, 75 km, 88 km, 95 km and 98 km interfering contours from WWOR's DTV allotment.

## COHEN, DIPPELL AND EVERIST, P. C.

**ENGINEERING STATEMENT  
WWOR-TV**

**PAGE 6**

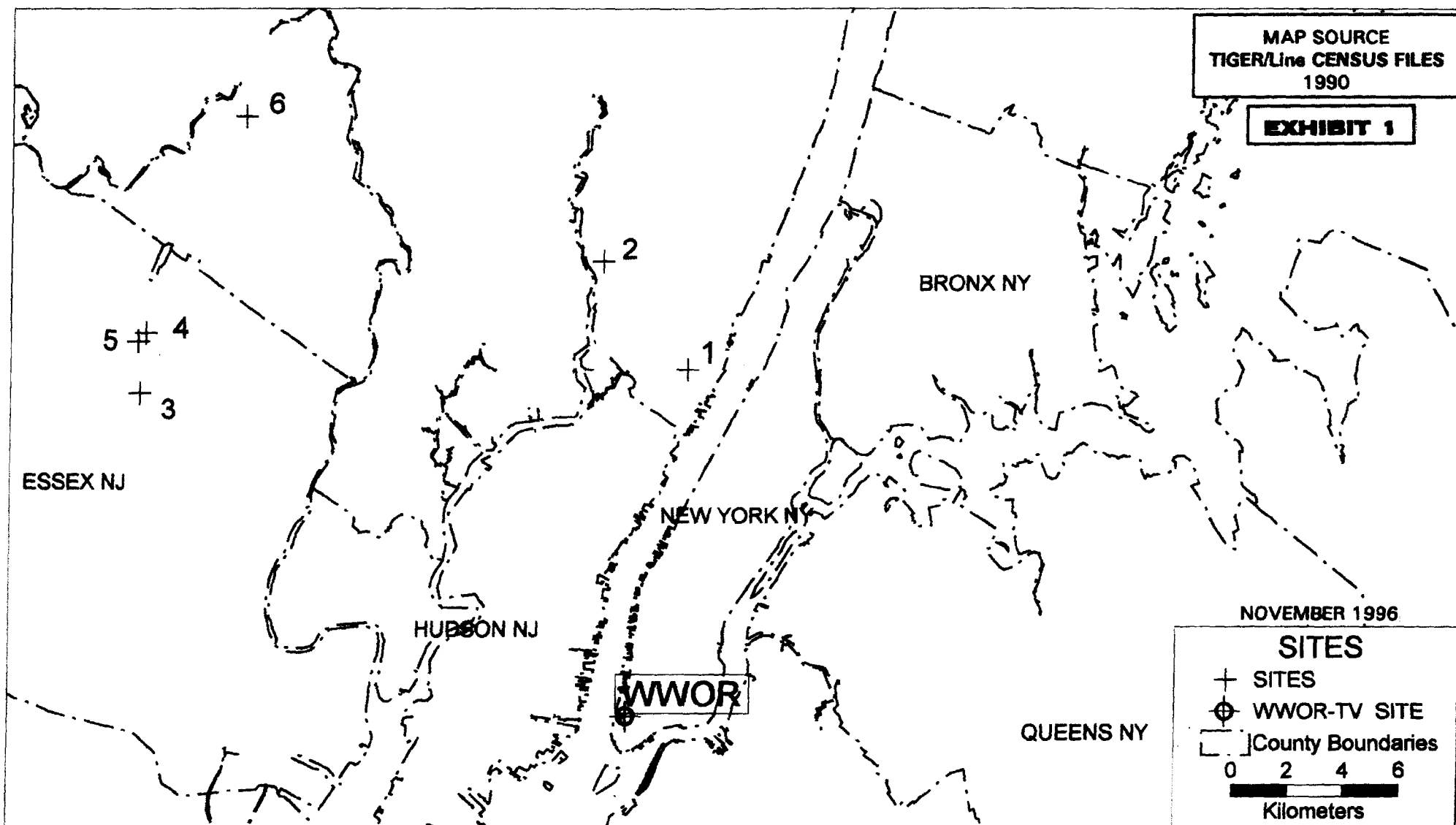
This preliminary evaluation indicates that for the frequencies 500 MHz to 506 MHz that within these distances 98.2 km to 29.0 km (61 to 18 miles), there is predicted DTV interference to the land-mobile station's 39 dBu contour.

A further preliminary study of six land-mobile sites has been performed by accessing the Commission's land-mobile data base. The proposed DTV 18 WWOR operation will exceed in the values listed for each frequency as shown in the following table. In other words, WWOR-DTV will exceed interference thresholds to land-mobile sites 1-6 across the entire land-mobile Channel 19 (500-506 MHz). See Exhibit 1 for a plot of the identified land-mobile sites in relation to the proposed WWOR DTV allotment. For a 24 dBu usable land-mobile contour, interference threshold values would be 15 dB worse.

Site	Land Mobile Base km (Miles)	Computed WWOR-DTV Ch. 18 Field Strength * dBu	WWOR F(50,10) Signal Level Over Threshold Interference to 39 dBu Land Mobile Field Strength (dB)						
			500 MHz	501 MHz	502 MHz	503 MHz	504 MHz	505 MHz	506 MHz
1	12.6 (7.85)	92.8	25.8	25.2	23	19.6	14.7	8.4	0.8
2	16.4 (10.18)	95.7	28.7	28.1	25.9	22.5	17.6	11.3	3.7
3	21.0 (13.06)	94.4	27.4	26.8	24.6	21.2	16.3	10.0	2.4
4	22.1 (13.75)	94.0	27.0	26.4	24.2	20.8	15.9	9.6	2.0
5	22.2 (13.77)	93.9	26.9	26.3	24.1	20.7	15.8	9.5	1.9
6	25.6 (15.90)	92.4	25.4	24.8	22.6	19.2	14.3	8.0	0.4

\*Includes typical 0.75° beam tilt television antenna relative vertical field response





COHEN, DIPPELL AND EVERIST, P.C. Consulting Engineers Washington, D.C.

CARBON PA

**EXHIBIT 2**

**LAND MOBILE SITES**

- WWOR-TV 98 KM
- WWOR-TV 95 KM
- WWOR-TV 88 KM
- WWOR-TV 75 KM
- WWOR-TV 62 KM
- WWOR-TV 45 KM
- WWOR-TV 29 KM

⊕ WWOR-TV SITE

⚡ LM 500.0-500.5 mhz

□ County Boundaries

— State Boundary

0 10 20 30

Kilometers

NOVEMBER 1996

PA

CHESTER PA

DELAWARE PA

PHILADELPHIA PA

MAP SOURCE  
TIGER/Line CENSUS FILES  
1990

CAMDEN NJ

BURLINGTON NJ

OCEAN NJ

MONTMOUTH NJ

MERCER NJ

BUCKS PA

HUNTERDON NJ

SOMERSET NJ

MIDDLESEX NJ

RICHMOND NY

UNION NJ

ESSEX NJ

NEW YORK NY

HUDSON NY

BRONX NY

QUEENS NY

KINGS NY

NASSAU NY

BERGEN NJ

MORRIS NJ

WARREN NJ

NORTHAMPTON PA

29 KM

45 KM

62 KM

75 KM

88 KM

95 KM

98 KM

**COHEN, DIPPELL AND EVERIST, P.C.** Consulting Engineers Washington, D.C.

### EXHIBIT 3

#### LAND MOBILE SITES

- WWOR-TV 98 KM
- WWOR-TV 95 KM
- WWOR-TV 88 KM
- WWOR-TV 75 KM
- WWOR-TV 62 KM
- WWOR-TV 45 KM
- WWOR-TV 29 KM



WWOR-TV SITE



LM 500.5-501.5 mHz



County Boundaries



State Boundary

0 10 20 30

Kilometers

NOVEMBER 1996

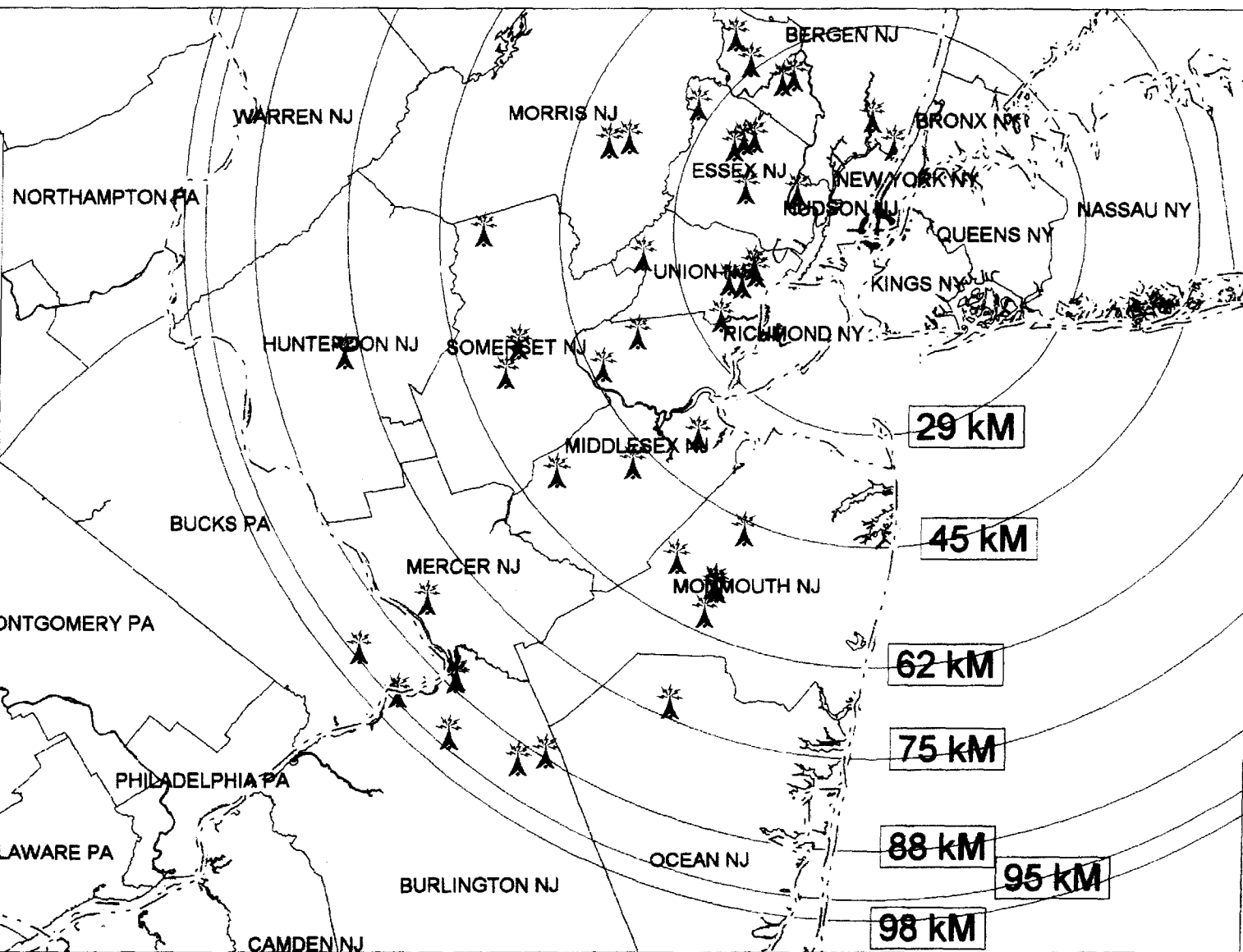
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CHESTER PA

DELAWARE PA

PHILADELPHIA PA

MAP SOURCE  
TIGER/Line CENSUS FILES  
1990



COHEN, DIPPELL AND EVERIST, P.C. Consulting Engineers Washington, D.C.

**EXHIBIT 4**

**LAND MOBILE SITES**

WWOR-TV 98 KM

WWOR-TV 95 KM

WWOR-TV 88 KM

WWOR-TV 75 KM

WWOR-TV 62 KM

WWOR-TV 45 KM

WWOR-TV 29 KM



WWOR-TV SITE



LM 501.5-502.5 mHz



County Boundaries



State Boundary

0 10 20 30

Kilometers

NOVEMBER 1996

PA

CHESTER PA

DELAWARE PA

PHILADELPHIA PA

MAP SOURCE  
TIGER/Line CENSUS FILES  
1990

CAMDEN NJ

BURLINGTON NJ

OCEAN NJ

MONMOUTH NJ

MERCER NJ

BUCKS PA

HUNTERDON NJ

SOMERSET NJ

UNION NJ

RICHMOND NY

KINGS NY

QUEENS NY

NASSAU NY

BRONX NY

BERGEN NJ

MORRIS NJ

WARREN NJ

NORTHAMPTON PA

CARBON PA

29 KM

45 KM

62 KM

75 KM

88 KM

95 KM

98 KM

**COHEN, DIPPELL AND EVERIST, P.C.** Consulting Engineers Washington, D.C.

**EXHIBIT 5**

**LAND MOBILE SITES**

- WWOR-TV 98 KM
- WWOR-TV 95 KM
- WWOR-TV 88 KM
- WWOR-TV 75 KM
- WWOR-TV 62 KM
- WWOR-TV 45 KM
- WWOR-TV 29 KM



WWOR-TV SITE



LM 502.5-503.5 mHz



County Boundaries



State Boundary

0 10 20 30

Kilometers

NOVEMBER 1996

PA

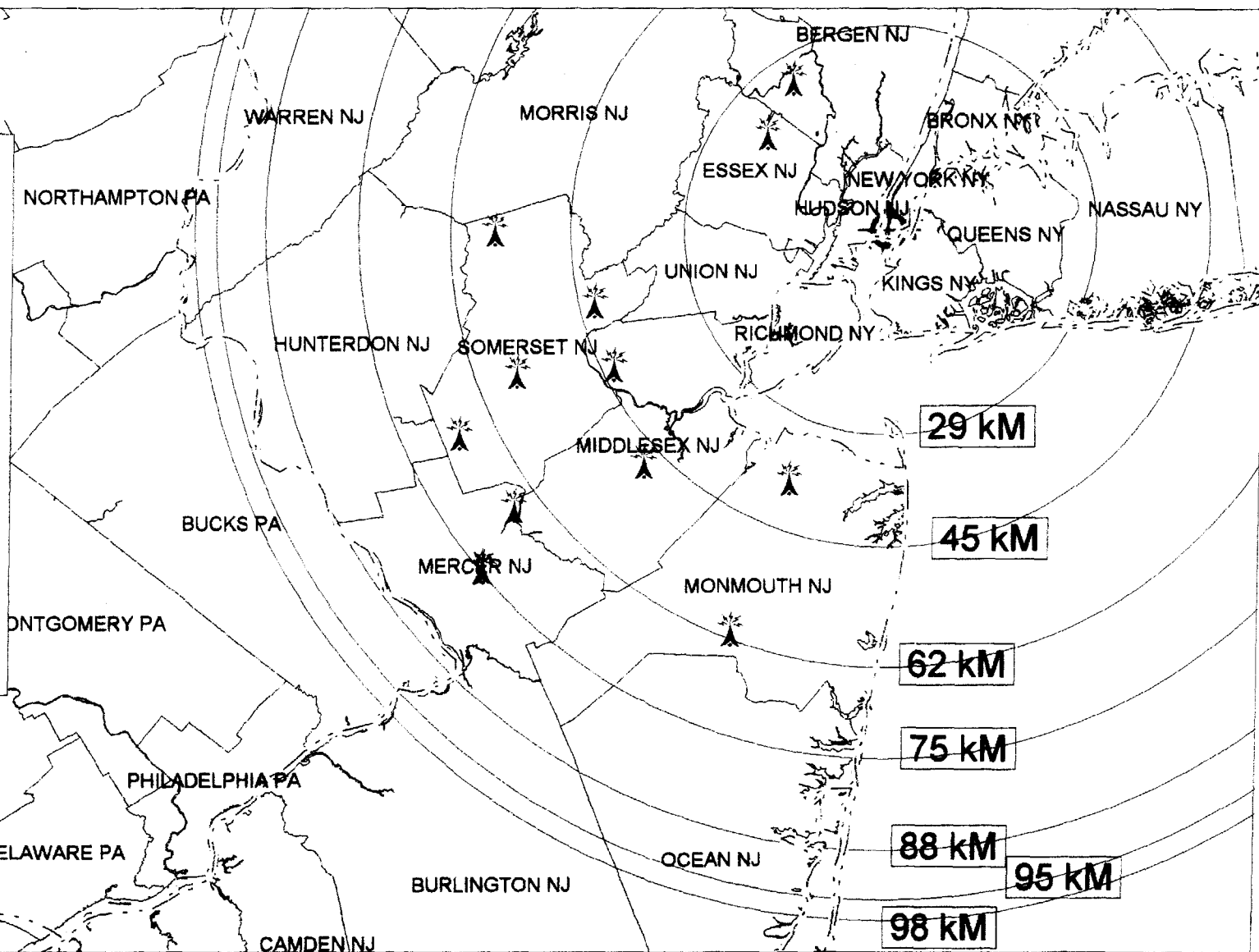
CHESTER PA

DELAWARE PA

PHILADELPHIA PA

MAP SOURCE  
TIGER/Line CENSUS FILES  
1990

**COHEN, DIPPELL AND EVERIST, P.C.** Consulting Engineers Washington, D.C.



**EXHIBIT 6**

**LAND MOBILE SITES**

- WWOR-TV 98 KM
- WWOR-TV 95 KM
- WWOR-TV 88 KM
- WWOR-TV 75 KM
- WWOR-TV 62 KM
- WWOR-TV 45 KM
- WWOR-TV 29 KM



WWOR-TV SITE



LM 503.5-504.5 mHz



County Boundaries



State Boundary

0 10 20 30

Kilometers

NOVEMBER 1996

PA

CHESTER PA

DELAWARE PA

PHILADELPHIA PA

MAP SOURCE  
TIGER/Line CENSUS FILES  
1990

CAMDEN NJ

BURLINGTON NJ

OCEAN NJ

MORRISTOWN NJ

MERCER NJ

BUCKS PA

MIDDLESEX NJ

HUNTERDON NJ

SOMERSET NJ

RICHMOND NY

UNION NJ

HUDSON NJ

NEW YORK NY

BRONX NY

BERGEN NJ

NASSAU NY

QUEENS NY

KINGS NY

NORTHAMPTON PA

WARREN NJ

MORRIS NJ

29 KM

45 KM

62 KM

75 KM

88 KM

95 KM

98 KM

**COHEN, DIPPELL AND EVERIST, P.C.** Consulting Engineers Washington, D.C.

**EXHIBIT 7**

**LAND MOBILE SITES**

- WWOR-TV 98 KM
- WWOR-TV 95 KM
- WWOR-TV 88 KM
- WWOR-TV 75 KM
- WWOR-TV 62 KM
- WWOR-TV 45 KM
- WWOR-TV 29 KM



WWOR-TV SITE



LM 504.5-505.5 mHz



County Boundaries



State Boundary

0 10 20 30

Kilometers

NOVEMBER 1996

PA

CHESTER PA

PHILADELPHIA PA

DELAWARE PA

MAP SOURCE  
TIGER/Line CENSUS FILES  
1990

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